RA Meeting with Wyoming Mining Association (WMA) in Cheyenne on October 31, 2019

Agenda:

1) **IRIS Assessment Plan for Uranium:**
   - Discussion of Association comments on the IRIS Assessment Plan:
     - The WMA is concerned about how EPA will use updated IRIS assessment toxicity values, especially the non-cancer oral reference dose (RfD), in selecting remediation criteria for CERCLA sites in the future, as the criteria might apply to mine cleanups.
     - In their comments from February 26, 2019, the WMA requested that EPA consider the references cited below in any risk assessment update for uranium:
       - 2013 Agency for Toxic Substances and Disease Registry (ATSDR) - *Toxicological Profile for Uranium*
       - 2017 United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) - *Sources, Effects, and Risks of Ionizing Radiation - Annex D, Biological Effects and Risks of Selected Internal Emitters - U*
     - The WMA also requested that the discussion on uranium toxicity prepared by Dr. Nancy Standler MD, Ph.D. be considered in the IRIS assessment, which cited additional technical references on uranium toxicity, including a paper from the Veterans Administration on depleted uranium.
     - The WMA concluded by highlighting the prevalence of naturally occuring uranium and its background variability in environmental media and requesting that this be considered in EPA's IRIS assessment.
   - Status update from EPA on the assessment including:
     - Rationale/reason for the assessment.
     - Data sources being considered.
     - Technical literature being reviewed and considered.
     - Potential applications for the completed assessment including; applicability to new rulemakings, in-situ wellfield restoration, Superfund Sites and remediation efforts including those around Grants, New Mexico
     - Availability of a draft assessment for public review and comment.
     - Scheduled completion date for the assessment.

Background for RA: In January 2018, EPA released the Scoping and Problem Formulation Materials associated with an IRIS Assessment Plan for Uranium that was focused on deriving a non-cancer Oral Reference Dose (RfD) toxicity value for use in EPA Risk Assessments. An IRIS Assessment Plan (IAP) communicates to the public the plan for assessing each individual chemical and includes summary information on the IRIS Program's scoping and initial problem formulation; objectives and specific aims for the assessment; the Populations, Exposures, Comparators, and Outcomes (PECO) criteria that outlines the evidence considered most pertinent to the assessment; and identification of key areas of scientific complexity. The PECO provides the framework for developing literature search strategies and inclusion/exclusion criteria, particularly with respect to evidence stream (i.e., human, animal, mechanistic), exposure measures and outcome measures.

In early 2018, EPA solicited comments on the Uranium IAP from stakeholders and received comments from WMA (summarized in the text above) and other uranium mining industry groups echoing the WMA comments. Later in 2018 EPA prioritized its IRIS assessments to meet the highest needs of EPA Programs and Regions and to bring greater focus to assessments actively under development. Accordingly, IRIS assessments for hexabromocyclododecane (HBCD), acrylonitrile, n-butyl alcohol, and phthalates (butyl benzyl phthalate, dibutyl phthalate, diethyl phthalate, di-isobutyl phthalate, and di-isononyl phthalate) were discontinued. New or updated assessments for these will not be added to the IRIS database at this time. Other assessments that were not identified as priorities for fiscal year 2019 have been suspended but may be restarted as Agency priorities change in the future. These include ammonia, chloroform, ethylbenzene, formaldehyde, manganese, naphthalene, nitrite/nitrate, PAH mixtures, and **uranium**. As such, there is nothing more to report on the progress of the Uranium IAP effort currently.

Talking Point for RA: EPA appreciates the comments provided by the WMA and other stakeholders on the Uranium IRIS Assessment Plan proposed in 2018 along with the cited references for consideration. We recognize that there is a large body of existing evidence on uranium toxicity and background variability, both of which are important considerations in EPA risk assessments. EPA has prioritized IRIS assessments to meet the highest needs of EPA Programs and Regions and to bring greater focus to assessments actively under development. In the prioritization for 2019, the uranium IAP was not selected for development, so there is not work underway to derive non-cancer Oral Reference Dose (RfD) toxicity value.

2) **Aquifer exemptions, specifically acceptance of the previously proposed use of Public Land Survey System (PLSS) boundaries (the nearest quarter/quarter corner at least 1/4 mile from the monitor well ring) to define aquifer exemption boundaries and streamlined approval of minor changes to those boundaries.**
    - The boundary should be, "*The right to mine; but no more than the area within the monitor well ring plus a distance to the next quarter quarter (¼ ¼) section boundary that is at least one quarter (¼) mile from the monitor well ring.*"
    - Environmental Protection Agency's (EPA's) Guidance Document for the Area of Review Requirement (May 1985), states that *"A State program should use all available resources at its disposal to incorporate flexibility, the use of hydrologic intuition, and past experience to guide the AOR process"*
    - The considerable experience of in-situ uranium recovery facilities in Wyoming demonstrates that in fact providing a quarter mile aquifer exemption area or "buffer zone" beyond the monitor well ring provides necessary operational flexibility without endangering potential Underground Sources of Drinking Water (USDWs).
    - A boundary based upon the Public Land Survey System (PLSS) is easier/simpler to define

Background for RA: The Wyoming Department of Environmental Quality (WDEQ) Land Quality Division (LQD) has primacy for the Class III UIC program, which includes uranium in-situ recovery (ISR) activities. In 2005, the LQD revised their regulations and delineated the aquifer exemption (AE) boundary for ISR Class III permits based on the Public Land Survey System (PLSS) boundaries to include the nearest quarter/quarter section beyond the monitoring

well ring (MWR). The MWR consists of wells that circumscribe the mining area to detect ISR fluids that move out of the mining area.

The UIC program's AE regulatory criteria applicable to ISR activities, 40 CFR §146.4 (b)(1), states that the aquifer or portions thereof "is mineral, hydrocarbon or geothermal energy producing, or can be demonstrated by a permit applicant as part of a permit application for a Class II or III operation to contain minerals or hydrocarbons that considering their quantity and location are expected to be commercially producible." Following the issuance of the 2005 revisions, EPA Region 8 informed the WDEQ that the arbitrary nature of extending the AE boundary a certain distance beyond the MWR is not consistent with the geologically based criteria in (b)(1), as this may result in the AE boundary extending beyond the portion of the aquifer containing minerals. The AE boundary historically had been set at the monitoring well ring. This approach was replaced in 2011, when Lost Creek LLC, a Wyoming ISR operator, requested a meeting with both WDEQ and EPA and proposed an alternative to the PLSS nearest quarter/quarter designation that is based on site hydro-geology. The EPA and WDEQ accepted this approach as it still provides the operator some distance outside of the MWR and is consistent with the geologically based regulatory criteria.

- This approach has since been used by all Wyoming ISR operators, with slight variances, to determine the extent of the AE boundary.
- In 2013, a WDEQ rule revision removed the language that drew the AE boundary to the nearest quarter/quarter section.

Talking Point for RA: The operator must demonstrate to the State and EPA that the proposed AE boundary is within an area that contains minerals that are expected to be commercially producible. An operator can use the PLSS for delineating the AE boundary if they can make that demonstration for that area.

3) **Memorandum of Understanding between EPA and NRC - Superfund and Sites in Agreement States**
   - The October 9, 2002, the Memorandum of Understanding (MOU) entitled *CONSULTATION AND FINALITY ON DECOMMISSIONING AND DECONTAMINATION OF CONTAMINATED SITES* should be revised to include both uranium recovery sites under direct Federal jurisdiction and those under Agreement State jurisdiction.
   - Uranium recovery sites regulated by Agreement States should also be excluded from CERCLA because there remains overriding Federal authority over these sites.
   - Section 83 of the Atomic Energy Act requires final Nuclear Regulatory Commission (NRC) release of these sites following final decommissioning, groundwater restoration and reclamation.

Background Information
Both the Nuclear Regulatory Commission (NRC) and the Environmental Protection Agency (EPA) have authorities which can apply to the decommissioning of NRC-licensed facilities. Both agencies have mutual goals for protection of public health and safety and the environment. NRC's focus is on the Atomic Energy Act (AEA) and the associated safe handling and disposal of radioactive materials and reclamation of licensed facilities. EPA's focus is mainly through the Comprehensive Environment Response, Compensation, and Liability Act (CERCLA), better known as the Superfund Program. Some NRC sites may also be subject to Resource Conservation and Recovery Act (RCRA).

EPA formalized a policy in 1983 in which EPA will defer CERCLA authority of currently-licensed NRC decommissioning sites, unless requested by NRC. While EPA followed this policy in general, the lack of coordination resulted in inconsistent cleanup approaches between EPA and NRC and resulted in multiple disagreements nation-wide. Most of the disagreements were on cleanup levels and consistency of cleanup levels with anticipated future land uses (e.g., applying industrial cleanup levels to areas planned for residential use), whether institutional controls were needed or appropriate, and sometimes the use of alternate criteria for license termination (such as alternate concentration levels or supplemental standards). At one point in 1997 EPA contemplated withdrawing the deferral policy.

From the early 1980s to the late 1990s, EPA reviewed radiological sites, mostly through the preliminary assessment (PA) and Site Inspection (SI) and a scoring process known as the Hazard Ranking System (HRS). In Region 8, four radiological sites were listed on the NPL, two in Colorado (Lincoln Park and Uravan) and two in Utah (Monticello Mill and Monticello Radioactively Contaminated Properties). All of these met one or more of the consultation triggers in the NRC MOU, some other release, or strong community concerns which prompted the EPA to look into things. None of the Wyoming sites which existed at the time were considered for the NPL. Region 8 negotiated site-specific MOUs with those Agreement States for managing the process to coordinate roles and responsibilities to minimize duplicate regulation, costs, and efforts similar to the NRC MOU.
EPA and the NRC were directed by the House Appropriation Committee in FY2000 to work on a Memorandum of Understanding (MOU), intended to coordinate roles and responsibilities. EPA and NRC began negotiating in 2000 with the goals of:

- coordinating roles and responsibilities to improve relationships between the NRC and the EPA and minimize the potential for "dual regulation";
- improve stakeholder confidence; and
- use federal dollars more efficiently.

The 2002 MOU
The MOU was signed in 2002. The 2002 MOU retains most of the 1983 general deferral policy but establishes a consultation and coordination process between EPA and NRC. It addresses some situations not anticipated in the original policy. Key provisions include:

- The MOU added facilities with licenses terminated before 1983, rather than those under license in 1983.
- From the MOU, situations which trigger NRC to notify EPA for consultation include:
    - Radionuclide MCLs will be exceeded in ground water.

    - Residual soil levels for most of the common soil radionuclides will exceed the upper end (one in ten thousand or 10^{-4}) of the CERCLA risk range (Summarized in Table 1 to the MOU).
    - NRC contemplates future use of the site will be restricted by conditions in license termination. Institutional controls may be needed to assure post-cleanup risks are consistent with the future land use.
    - NRC contemplates use of alternative criteria for license termination, which may present risks not be compatible with anticipated or beneficial use.
- EPA will resolve, in consultation with NRC, concerns involving hazardous substances outside of NRC jurisdiction at licensed sites, such as solvents or fuels which may have been used. EPA under CERCLA will defer or consult with NRC as appropriate regarding matters involving AEA materials under NRC's jurisdiction.
- EPA will consult with NRC if EPA does not agree with NRC's decision, particularly if EPA plans to take Superfund actions.
- If EPA takes action, the MOU does not affect how CERLCA actions are conducted. Under the NCP, EPA expects to evaluate remedies considering one in a million (10^{-6}) as the first risk goal.

Implementation
NRC organizes the consultation into two levels: Level 1 is for active licensed sites which have not yet reached some form of decommissioning or license termination plan. Level 2 consultation is for sites already undergoing license termination or decommissioning under an NRC approved plan. Sites in the "gray zone" during negotiation of the MOU were addressed through notification letters.

Agreement States
The NRC can delegate its licensing authority to states, called Agreement States. States have to apply for the authority and demonstrate the appropriate capacities and abilities to administer the NRC rules. Based on NRC's website currently there are over 35 Agreement States. Wyoming and Vermont are both in the application process.
The 2002 MOU is for sites licensed directly by NRC. Because states are not signatory to the MOU, the requirements and protections of the MOU do not extend to sites operating under Agreement State licenses. There has been no national effort to address the 35 plus Agreement States because each state is different and has its own state laws.
As a matter of policy, EPA follows the same consultation guidelines and processes for sites managed by Agreement States as for NRC-lead sites. Under site-specific MOUs negotiated with Agreement States, EPA does expect notification of any of the triggers for consultation and reserves the right to act to achieve CERCLA requirements. EPA may or may not evaluate sites for NPL listing but will be concerned about actions taken to address the associated risks.

Key Messages
- None of the uranium-contaminated sites in Wyoming are listed on the NPL.
- Wyoming recently became an Agreement State (Sept. 2018).
    - There is not a current MOU between EPA and the state of Wyoming for uranium sites.

- If Wyoming becomes an agreement state and wants the same protections as provided in the EPA-NRC MOU, Wyoming would need to negotiate an MOU between EPA Region 8 and the state.

4) **Simplify requirements for minor changes to aquifer exemption boundaries.**
   - Minor changes to aquifer exemption boundaries should be a simple administrative matter and not require public notice.

Background for RA: In working with the WDEQ on reviewing past uranium ISR-related aquifer exemption requests, EPA Region 8 recognizes the on-the-ground reality of adjusting previously delineated and approved exempted areas after drilling and operation of wellfields commence. We have had only preliminary discussions with the WDEQ about this issue which were informed by EPA's proposed approach for determining, and addressing subsequent changes to, AE boundaries for the proposed Dewey Burdock uranium ISR project in South Dakota. More specifically, the EPA's dynamic approach is designed to accommodate "minor changes" to AE boundaries so long as such changes keep the boundary within one-quarter mile of the originally-identified uranium ore deposit boundary and the operator can demonstrate commercially-producible uranium ore deposits within the new boundary. The WDEQ expressed interest in talking further about the Region's proposed approach for Dewey Burdock.

Talking Point for RA: We have had preliminary conversations with the WDEQ to identify a mutually agreeable policy approach to address this issue and will keep the WMA informed of our progress. While more discussions with the WDEQ are needed, you are welcome to review and comment on the Region's proposed approach for determining, and addressing subsequent changes to, AE boundaries for the proposed Dewey Burdock uranium ISR project in South Dakota.